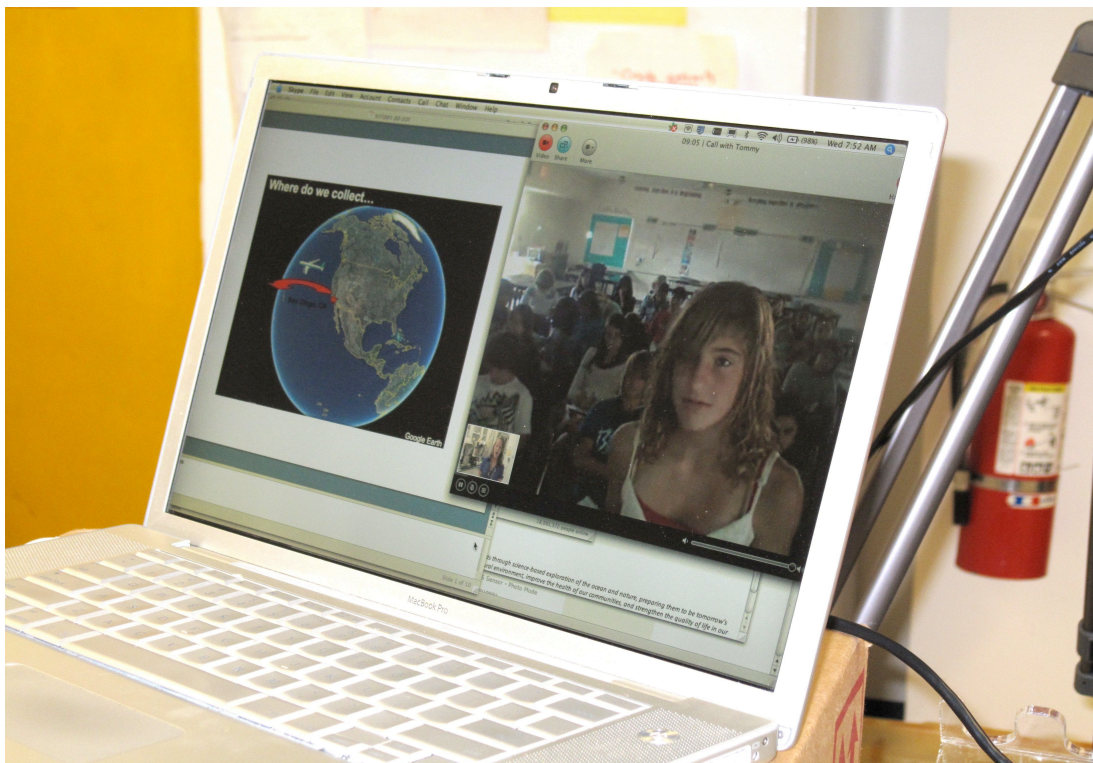


Technology-enabled Collaboration and Communication



COSEE Web Infrastructure: ***Supporting Collaborations and Connections via a Networked Web Presence***

At the July 2007 COSEE Council meeting, the Web Working Group (WWG) was formed by consensus to examine how the Centers could interactively work together to make existing / future COSEE information more accessible, engaging, and up-to-date. The result of this effort was the Content Management System (CMS) and a collection of integrated websites that were implemented in January 2008 for use by an initial six Centers and the Network (COSEE.net).

The WWG supports productive collaborations and connections among institutions, organizations, and individuals involved in COSEE's web-based ocean sciences education efforts by centralizing the online posting of news, events, blogs, educational and scientific resources, and staff information; encouraging the sharing of these across Centers and COSEE.net; and promoting the use of common terminology among Centers.

Taking advantage of its web infrastructure, members of the COSEE Network identify research-based ocean sciences education resources and disseminate these for use by educators, scientists, and students via Center websites. These resources include documents, websites, publications, lesson plans, and other items that can be used in ocean science education. Centers may also send vetted resources directly to web administrators for posting on COSEE.net or other Center websites by email or via the website CMS sharing functionality.

The COSEE File Manager serves as a repository and access portal for documents belonging to COSEE. This application - a Web Working Group product - cultivates linkages and promotes collaboration within the Network by supporting file sharing among Centers, working groups, and the National Coordinating Office.

In July 2009, the WWG agreed to initiate the “Excellence in Networking Tools Sub-Working Group” (ENTS-WG or “ENTS”). The ENTS acts as a vehicle for ongoing dialogue regarding the uses, development and implementation of social networking tools. The ENTS charter is: *“Explore new ways to broaden the reach of COSEE by using social networking tools to increase internal / external collaboration, communication, and exposure.”*

COSEE is taking advantage of technology that will continue to foster communication and collaboration across – and beyond -- the Network. In a development process that has lasted less than three years, highly coordinated inter-Center communication has greatly improved the quality and impact of COSEE products and services. More importantly, this initial investment has positioned COSEE to seize opportunities in technology-heavy initiatives coming from NSF and other agencies. In the future, COSEE will be a key contributor to a virtual community dedicated to furthering the goal of integrating ocean sciences research and education.

The five documents in this chapter provide more detail on the aspects of Web infrastructure that foster technology-enabled collaboration and communication across COSEE.

Web Working Group: Supporting Collaborations and Connections Between Institutions, Organizations, and Individuals in Ocean Sciences Education

The Web Working Group (WWG) supports productive collaborations and connections among institutions, organizations, and individuals involved in COSEE's web-based ocean sciences education efforts by centralizing the online posting of news, events, educational and scientific resources, and staff information; encouraging the sharing of these across Centers and COSEE.net; and promoting the use of common terminology among Centers.

I) Web Working Group History

The Web Working Group (WWG) was formed by consensus at the 28 July 2007 Council meeting and charged to examine how the Centers could work together interactively to make existing and future COSEE information more accessible, engaging, and up-to-date. Today, the WWG supports productive collaborations and connections between institutions, organizations and individuals involved in COSEE's online ocean sciences education efforts across the United States and beyond through a well-designed and networked web presence.

II) Strategy and Approach

By 2007, it had become clear that the COSEE web presence needed to be improved to 1) better serve the growing National COSEE Network and 2) provide a point of access for the broader ocean science education community. This need led to the formation of the WWG at the July 2007 Council meeting, which was charged to examine how Centers can work together interactively to make existing and future COSEE information more accessible, engaging, and up-to-date. Initially, the WWG consisted of 12 representatives from 8 Centers, the COSEE Coordinating Office (CCO), and Raytheon Web Solutions (the software contractor who was engaged through COSEE Ocean Systems). The WWG met two to four times per month to carry out ongoing duties with respect to the original charge.

The WWG began the task of building a better web presence by analyzing the differences and commonalities among existing Network websites, finding that 1) some COSEE sites were organized by audience, but most were not; 2) different terms were being used by different Centers to describe essentially the same content; 3) some assets and functions were offered by nearly every Center; and 4) there were (at least) three very general categories of assets and functions including news/activities, educational products/processes, and targeted partners/partnerships. Based on this initial analysis, the WWG conducted a Network-wide survey in September 2007, finding overall agreement from 55 respondents representing all Centers, the COSEE Council, the National Advisory Committee (NAC), and others that COSEE should:

- Focus on a primary audience without precluding non-targeted audiences.

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- Enable search and retrieval of web information according to audience type.
- Use common terminology.
- Take into account the needs of varied audiences when developing future web content, tools, etc.
- Centralize/integrate some assets and information.
- Streamline data entry.
- Develop tools, databases, and audience-focused terminology that does not overshadow the unique qualities of individual Centers.
- Designate items as "Center-specific" and/or "Network-accessible" for database search and retrieval.

Following the September 2007 survey, 36 members of the COSEE Community representing 11 Centers and the CCO spent over 500 person-hours discussing the design, functionality, implementation, and improvement of the Network website (COSEE.net) and Center websites while building and testing the integrated system. During this effort, the WWG:

- Completed a Network-wide terminology analysis to facilitate inter-Center collaboration and help future web visitors navigate seamlessly between the COSEE websites.
- Conducted five qualitative research studies to document commonalities and differences in terminology used on Center websites in order to simplify and unify for the web how COSEE describes its people and programs.
- Designed, developed, and implemented, with RWS, a common platform and unified Content Management System (CMS) for COSEE.net and participating COSEE Centers that centralizes the online posting of news, events, educational and scientific resources, and people; encourages the sharing of these across Centers and COSEE.net; and promotes the use of common terminology among Centers.
- Trained Center and Network administrators on how to operate the CMS and populate their websites.
- Populated the CMS database and tested system components, providing feedback to the developers for system refinements, while tentatively identifying desired improvements.
- Created audience-specific features (e.g. For Scientists, For Educators, For Students, etc.) to accompany as-built search and sort functionality, thus providing both automated filtering capabilities and the flexibility to locate requisite documentation across Centers and COSEE.net by user-defined keywords.
- Delivered, in January 2009, public web pages that are 508 compliant and have a unifying "COSEE look and feel" while still maintaining a Center's individuality.

III) Accomplishments

Since January 2009, the WWG has:

- Overseen the continued population of six Center websites and COSEE.net (Figure 1).
- With Raytheon Web Solutions, designed, developed, and implemented new functionality to allow those Centers not on the CMS to create "About Us" pages that display content, news, events, and a directory of people on COSEE.net and to share this information with other Centers. This functionality was also made available to select external partners, COSEE Working Groups, and the CCO.
- Modified existing functionality to include:

- A new A to Z menu on the Directory page to enable filtering by last name.
- The capability to assign people in the Directory an affiliation with entities other than the COSEE Centers or COSEE.net (e.g. the CCO, NAC, etc.).
- Publication of upcoming Center events on the home page of COSEE.net.
- Integrated Center and Network blogs.
- Improvements to behind-the-scenes administrative processes.
- Prepared an online tutorial on navigating the CMS and populating Center websites (<http://www.cosee.net/tutorials/cms/contents.htm>).
- Conducted interactive webinars to train Center administrators in posting and sharing news, events, resources, and directory information.
- Continued to meet two times monthly to collaboratively identify, evaluate, and prioritize action items to enhance the look and functionality of the websites.
- Updated the Network as to WWG activities with monthly articles in CNN, the online COSEE Network Newsletter (hosted since January 2009 on COSEE.net at <http://www.cosee.net/about/cnn/>).

As of June 2010, COSEE.net had 130 content pages, 320 individuals in the directory, and 165 items in its Resources database. Additionally, 133 Events and 65 News items have been posted on COSEE.net. These numbers do not include the content pages, resources, events, and news items that are hosted on the CMS-based Center websites.

In addition to the CMS and integrated websites, the WWG has overseen the development and implementation of the COSEE File Manager, which serves as a repository and access portal for documents belonging to COSEE. This application cultivates linkages and promotes collaboration within the Network by supporting the sharing of files between Centers, working groups, the CCO, and other COSEE entities in a password-protected environment readily accessible by all COSEE personnel.



Figure 1: Screen capture of www.cosee.net website.

Web Working Group: *Supporting Collaborations and Connections via a Networked Web Presence*

At the 28 July 2007 Council meeting, the Web Working Group (WWG) was formed by consensus to examine how the Centers could interactively work together to make existing / future COSEE information more accessible, engaging, and up-to-date. The result of this effort was the Content Management System (CMS) and collection of integrated websites that were implemented in January 2008 for use by an initial six Centers and the Network (COSEE.net). The CMS, which COSEE administrators use to populate and manage their websites—and the websites themselves—were constructed in accordance with a COSEE-wide survey that found agreement on important issues tied to (1) audience identification / targeting (78% strongly agree or agree "The Network should reach agreement on the primary audiences for its web assets"), (2) use of common terminology among Center websites (89% strongly agree or agree "Audiences would be better served if COSEE websites used common terminology"), and (3) centralization of many web functions (over 70% prefer to centralize the following: calendar of events, educational resources, funding opportunities, inter-Center projects, and relevant publications). The CMS software was developed by Raytheon Web Solutions (RWS) in conjunction with input from the WWG and uses a central web server so that functionality and data can be shared between Centers and COSEE.net.

The CMS and collection of Center/COSEE.net websites:

- Provide a full featured, integrated web presence for the COSEE Network (COSEE.net) and participating COSEE Centers
- Promote branding of the COSEE name
- Provide a look that captures the individuality of each COSEE while maintaining a consistent appearance with each other and COSEE.net
- Allow for rapid implementation of new Centers, partners, and other entities such as the COSEE National Coordinating Office
- Centralize the posting of news, events, educational and scientific resources, and people and encourages sharing of these across Centers and COSEE.net
- Promote the use of common terminology among Centers
- Help enforce 508 compliance by providing appropriate fields for data entry
- Allow authorized users to post content and create pages without support from RWS personnel or an HTML editor
- Provide a consistent web experience for users
- Allow users to search for information across all Centers and COSEE.net at once

I) Evidence

Collaborations and connections between Centers and the Network is evident by (1) the number and type of assets (news items, events, resources, and people) posted on the websites, (2) the number and type of assets shared between Centers and the Network, and (3) the ease with which assets are available for review and/or downloading by others. As of June 25, 2010:

- 6 Centers currently use the CMS, and with COSEE.net, present a consistent look and feel for ease of navigation (which is a significant improvement on the original websites - see Figures 1a-6b for the home pages of five Centers and COSEE.net before and after implementation of the CMS)
- All 12 Centers have access to About Us pages, which includes the capability to post content, news, events, and a directory of people on COSEE.net for review by others
- All Centers can share news, events, and resources with other Centers and COSEE.net
- Partners, working groups, the National Coordinating Office, and other entities will have the same About Us capabilities as the Centers by mid-July 2010
- 318 People, representing more than 165 organizations, are listed in the Directory for contact by others
- 65 News items are posted on COSEE.net (see Figure 1b) and 72 news items are posted on CMS Center websites (13 of which were shared with COSEE.net) (see Figure 7)
- 133 Events are posted on COSEE.net (see Figure 1b) and 58 events are posted on CMS Center websites (23 of which were shared with COSEE.net) (see Figure 8)
- 162 Resources have been added to COSEE.net and 159 resources are posted on CMS Center websites (26 of which have been shared with COSEE.net)

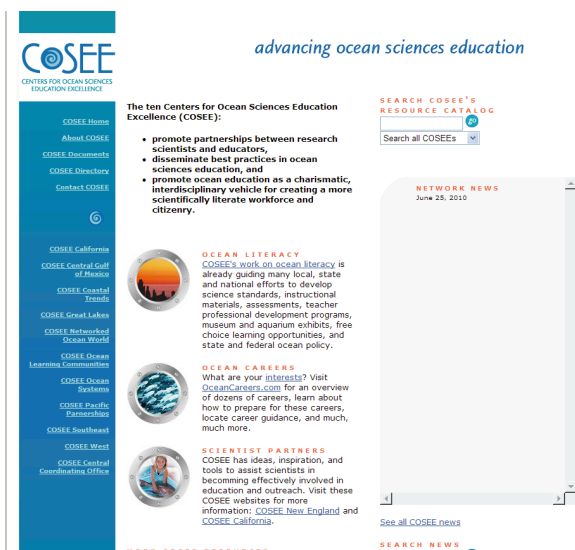


Figure 1a. The home page for COSEE.net before implementation of the current CMS.



Figure 1b. The current home page for COSEE.net.

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Figure 2a. The home page for COSEE California before implementation of the current CMS.



Figure 2b. The current home page for COSEE California.



Figure 3a. The home page for COSEE Coastal Trends before implementation of the current CMS.



Figure 3b. The current home page for COSEE Coastal Trends.

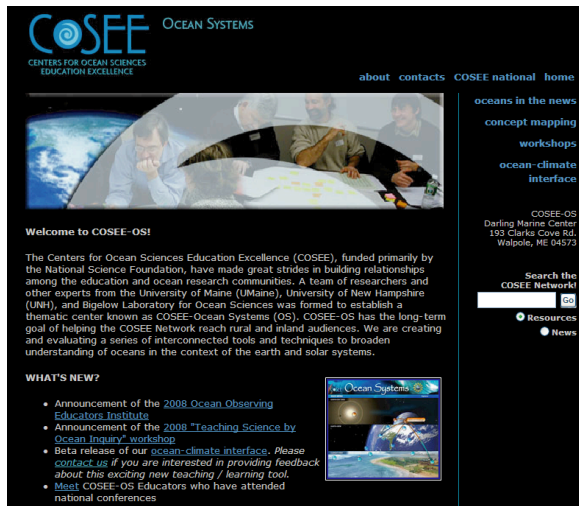


Figure 4a. The home page for COSEE-Ocean Systems before implementation of the current CMS.

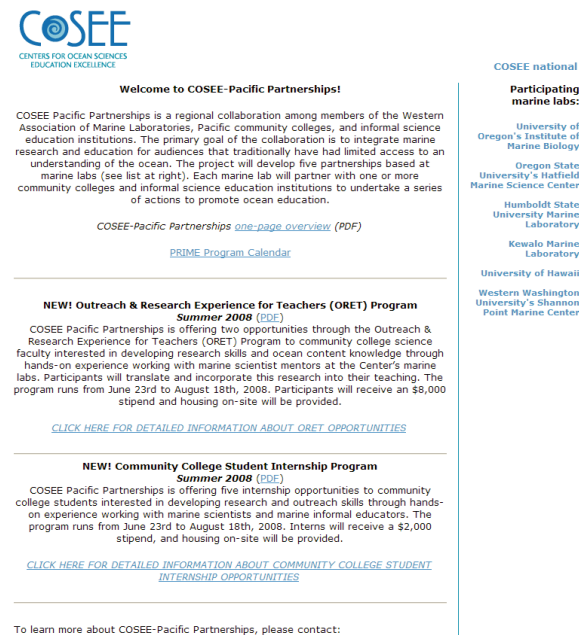


Figure 5a. The home page for COSEE Pacific Partnerships before implementation of the current CMS.

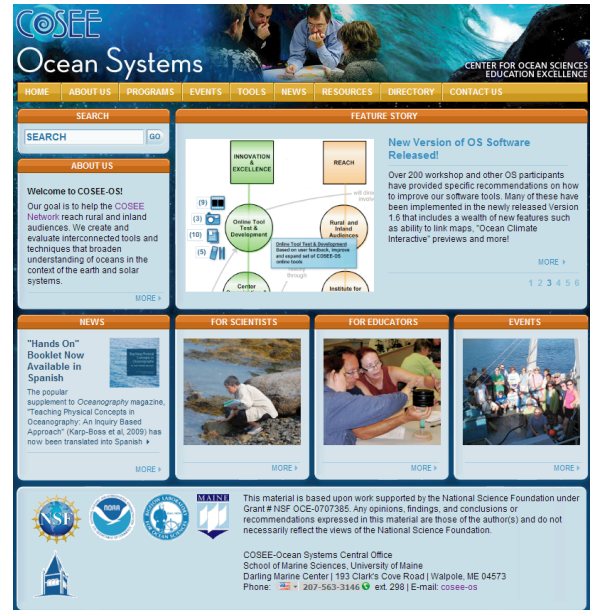


Figure 4b. The current home page for COSEE-Ocean Systems.



Figure 5b. The current home page for COSEE Pacific Partnerships.

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Figure 6a. The home page for COSEE West before implementation of the current CMS.



Figure 6b. The current home page for COSEE West (under development).

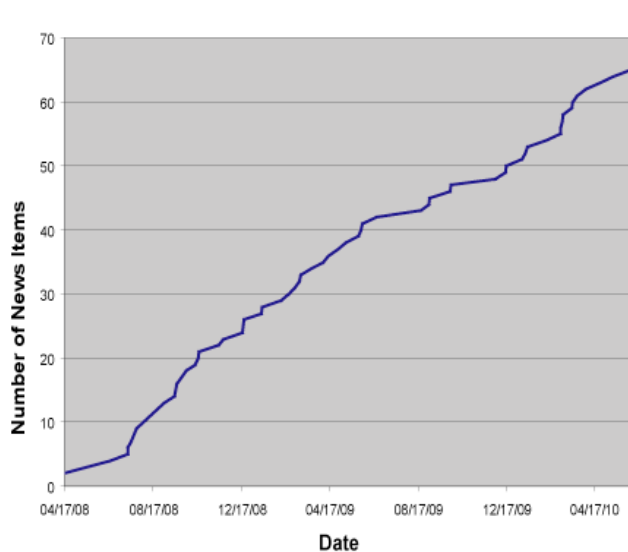


Figure 7. Number of news items added to COSEE.net over time.

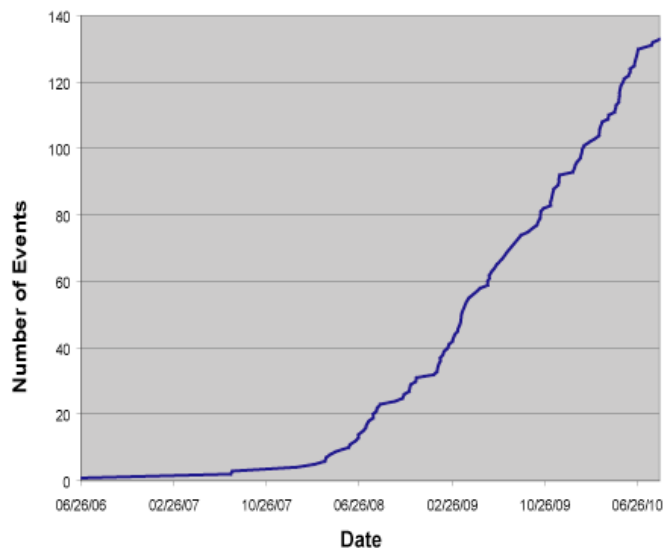


Figure 8. Number of events added to COSEE.net over time.

Web Working Group: *Disseminating Ocean Sciences Education Resources to K-16 Educators and Scientists*

COSEE identifies research-based ocean sciences education resources and disseminates these for use by educators, scientists, and students via Center websites. These resources include documents, websites, publications, lesson plans, and other items that can be used in ocean science education. Centers may also send vetted resources directly to web administrators for posting on COSEE.net or other Center websites by email or via the website Content Management System (CMS) sharing functionality. Users may:

- View all resources
- View existing content pages containing selected resources for use by COSEE-specified audiences
- Order by resource name or date
- Search resources by keyword
- Filter resources by resource category (e.g. For Scientists, For Educators, For Students) or type (e.g. document, poster, book). Categories and types are defined by Center and Network administrators and allow users to narrow down the number of resources returned by the CMS.

I) Available Resources on COSEE.net

As of June 23, 2010, the COSEE.net database (<http://www.cosee.net/resources/>) contained 162 resources, including 72 web-based links, 56 PDFs, 13 posters, and 22 other resource types (article, book, CD-ROM, videos/DVDs, etc). These resources have been sorted for automated filtering by users into the following categories (some of which fall under more than one category):

- 2 Brochures
- 1 Case Study
- 1 Conference Proceedings
- 23 COSEE Conference Resources
- 13 COSEE One-Pagers
- 88 For Educators
- 21 For Scientists
- 3 Journal Articles
- 1 Presentation
- 11 Reports
- 10 Student Resources
- 3 Teaching Resources
- 5 Tools
- 1 Website



Figure 2: Resources page (www.cosee.net/resources/) on the COSEE.net website.

The Center websites on the CMS have 159 resources posted, some of which have been shared with COSEE.net (Figure 1).

II) COSEE Network News (CNN)

In addition to compiling resources in the CMS database, COSEE identifies and posts links to ocean sciences resources external to the COSEE database in the online, monthly COSEE Network Newsletter (CNN). As of June 23, 2010, approximately 80 resources were listed in CNN (<http://www.cosee.net/about/cnn/>).

Web Working Group: *Cultivating Linkages and Promoting Collaborations Within the Network*

COSEE File Manager serves as a repository and access portal for documents belonging to COSEE. This application - a Web Working Group product - cultivates linkages and promotes collaboration within the Network by supporting file sharing among Centers, working groups, and the National Coordinating Office.

I) COSEE File Manager

The COSEE File Manager (CFM) serves as an online repository and access portal for documents belonging to COSEE. This application allows COSEE personnel to store files (e.g. PDF, xls, doc files) along with associated document information (title, description, author, publication date) for access by others, thus promoting collaboration across the Network. The CFM is password protected, but the tutorial is accessible by all and can be viewed at <http://www.cosee.net/filemanager/tutorial/tutorial01.htm>.

II) History

COSEE files were originally stored in Blackboard, a course management software that allows integration of student information systems and authentication protocols. Its main purposes are to add online elements to courses traditionally delivered face-to-face and to develop online courses with few or no face-to-face meetings. Blackboard was not designed for file management, proved cumbersome to learn and operate, and required user-developed passwords that were often forgotten, so it was replaced with a second File Manager (the OMP File Manager) in mid 2007. This new File Manager utilized File Transfer Protocol (FTP) whereby users could copy and download files to/from a host server located at the University of Rhode Island. The OMP File Manager lacked the ability to include accompanying meta data (i.e. document description, file owner, publication history, etc.) necessary for collaboration across geographically distinct entities, and was therefore replaced with the current CFM in November 2007.

The CFM was developed in-house by a COSEE Network administrator to enable:

- Collaboration across the Network via the use of file sharing
- Linkages between Centers, working groups, and the CCO by making essential documents available to all
- Distribution of style guides and images (e.g. logos) for consistent use in Network documents
- Protected access for document security
- Use of one password for all users, eliminating the need to provide, store, and retrieve individual user information
- Storage of meta data, thus making it easier for users to find pertinent documents, check for revisions, and evaluate document contents without having to download unnecessary files
- Ease of use without advanced training beyond the online tutorial and help desk

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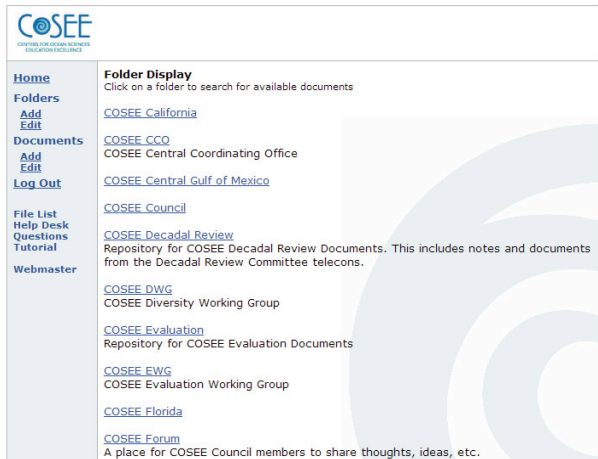


Figure 1. Layout of folders on the Home page of the current CFM.



Figure 2. List of files in the COSEE WWG folder and their descriptions.

The CFM will be migrated in late Summer 2010 to a new platform to support user-requested storage of documents in layered subfolders. Figures 1 and 2 show folders and Web Working Group (WWG) files in the current CFM. Figures 3 and 4 show two subfolders in the Working Groups folder and files stored in the WWG subfolder in the upcoming CFM.

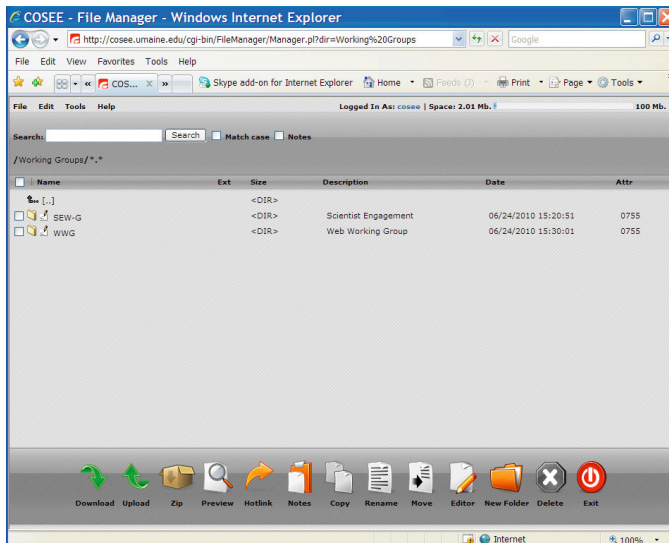


Figure 3. Layout of subfolders in the Working Groups folder of the pending CFM.

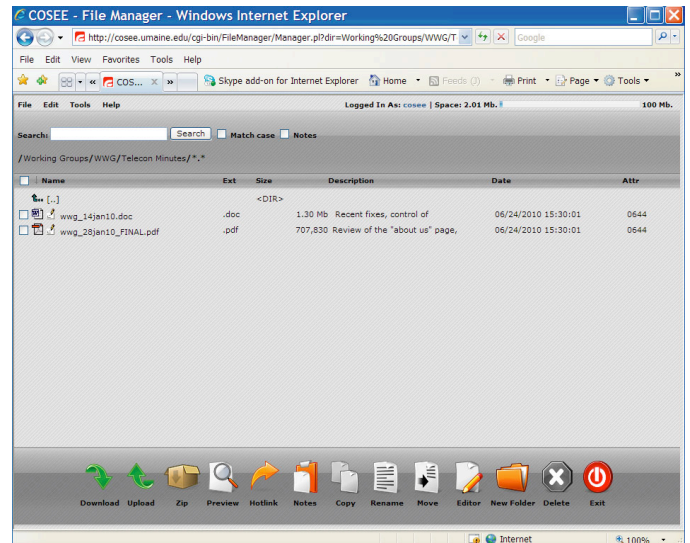


Figure 4. List of files in the WWG subfolder and their descriptions.

III) Evidence

As of June 24, 2010, the CFM contained 960 files, including 449 PDFs, 284 Word documents, 94 Powerpoint presentations, 75 graphic files, 38 Excel spreadsheets, and 20 other file formats (rtf, zip, htm, etc.). These documents are stored in the following user-created folders, which illustrates the extent of usage across Centers, working groups, and the National Coordinating Office over time (Figure 5):

COSEE California (10 files)
 COSEE NCO (National Coordinating Office, 7 files)
 COSEE Central Gulf of Mexico (29 files)
 COSEE Council (75 files)
 COSEE Decadal Review (11 files)
 COSEE DWG (Diversity Working Group, 1 file)
 COSEE Evaluation (101 files)
 COSEE EWG (Evaluation Working Group, 61 files)
 COSEE Florida (8 files)
 COSEE Forum (6 files)
 COSEE Great Lakes (35 files)
 COSEE GWG (Governance Working Group, 28 files)
 COSEE Images (42 files)
 COSEE Implementation Plan Committee (4 files)
 COSEE Mid-Atlantic (17 files)
 COSEE MMWG (Messaging/Marketing , 3 files)
 COSEE NAC (National Advisory Committee, 41 files)
 COSEE National Network Evaluation (11 files)
 COSEE Network (54 files)
 COSEE Network Meetings (38 files)
 COSEE New England (26 files)
 COSEE NOW (Networked Ocean World, 13 files)
 COSEE Ocean Systems (43 files)
 COSEE Pacific Partnerships (33 files)
 COSEE SEWG (Scientists Engagement, 3 files)
 COSEE SouthEast (15 files)
 COSEE Steering Committee (1 file)
 COSEE West (19 files)
 COSEE WWG (82 Web Working Group, 82 files)
 Council Check-in Calls (31 files)
 File Cabinet (58 files)
 General (30 files)
 Archived (24 files)

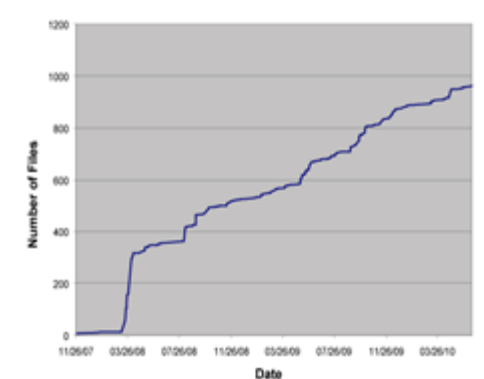


Figure 5: Number of files added to the CFM since November 2007.

Web Working Group: “*Excellence in Networking Tools Subgroup*” (ENTS)

In July 2009, the WWG agreed to initiate the “Excellence in Networking Tools Sub-Working Group” (ENTS-WG or “ENTS”). The ENTS acts as a vehicle for ongoing dialogue regarding the uses, development, and implementation of social networking tools. The ENTS charter is: “*Explore new ways to broaden the reach of COSEE by using social networking tools to increase internal / external collaboration, communication, and exposure.*” Carla Companion (COSEE OS) and Catherine Cramer (CCO) currently serve as co-Chairs of ENTS. The ENTS reports to the Council through the Chair of the WWG (Annette deCharon).

The main topics addressed by the ENTS has been:

- Strategies for support and development of social networking tools across COSEE
- Discussion of effective practices, standards, or guidelines for COSEE blogs and other social networking tools
- Creating resources for COSEE Centers to use as references and guidelines or to increase social networking literacy
- Evaluating the merits and appropriate use of various tools
- Evaluating and documenting the development and/or success in the use of these tools

Three primary products have been created through ENTS efforts are: 1)The “Online Tools Guidebook,” a resource for the network on web technology; 2)“Tools that Work,” a new section for technology-related success stories and case studies in COSEE Network News and; 3) a webinar series that gives network members an opportunity for training.

I) Online Tools Guidebook:

One key output of the ENTS is the “Online Tools Guidebook.” This wiki-based document (available at: <http://coseenow.net/ents>) was designed and created collaboratively during bi-weekly telecons. The purpose of the guidebook is “to help COSEE Network members become familiar with a wide variety of online tools and choose the tools that best fit their needs.” The wiki includes information about the relative benefits of choosing one software

Promotion of Events, Programs and Center Activities			
Tool	Usage	Cost	Technical
Twitter	CCO, Central Gulf of Mexico	Free to join	✓
Facebook	Networked Ocean World, Ocean Systems, West	Free to join	✓
Listserve	Central Gulf of Mexico, Excellence in Networking Tools, NCN, Pacific Partnerships, Web Working Group, West	\$	✓
Not Yet Reviewed: Mail Chimp			
Highlighting Programs, Events, and Past Accomplishments			
Tool	Usage	Cost	Technical
Blogs (Wordpress, Blogger, or other)	Networked Ocean World, New England, West	Some are free to get started	✓
Facebook	Ocean Systems, Networked Ocean Systems, West	Free to join	✓
Center website pages	COSEE Network	\$ \$ \$	✓
YouTube	California, Central Gulf of Mexico, Ocean Systems, West	\$	✓
Flickr	Central Gulf of Mexico, West	\$	✓
PhotoBucket	Central Gulf of Mexico	\$	✓
Picasa	None at this time	\$	✓
e-Newsletters	COSEE Network	\$	✓
Not Yet Reviewed:			
Sharing Produced Videos with the Public			
Tool	Usage	Cost	Technical
Center website pages	COSEE Network	\$ \$ \$	✓
YouTube	California, Central Gulf of Mexico, Ocean Systems, West	\$	✓
TeacherTube	None at this time	\$	✓
Facebook	Networked Ocean World, Ocean Systems, West	Free to join	✓
Not Yet Reviewed:			

Figure 3: The COSEE Online Tools Guidebook (<http://coseenow.net/ents>)

over the other (including cost, setup time, technical knowledge needed), categories describing the purposes these tools can have (such as promoting events, having online workshops, etc.) and “tips and tricks” added by ENTS and other COSEE Network members that have experience working with the tools. To aid the COSEE Network, there is also a list of Centers that are currently using the tools at the bottom of each page, encouraging cross-Center consultation and collaboration when implementing new tools and strategies.

II) “Tools That Work”

Stories about online technology that has been effectively used by Network members have also been integrated into a new feature in COSEE Network News, “Tools That Work.” These short case studies help to provide guidance for other Centers looking to adopt similar tools, and each story includes lessons learned by the Center when using the tool.

III) Webinar Series on Tool Training

The “Online Tools Guidebook” is also serving as the basis for a series of training opportunities for the COSEE Network. The first such webinar was held on 18 February 2010 as a joint effort between the ENTS and the Professional Development Ad Hoc Committee and introduced the Professional Development group to the online guidebook, which addresses many general questions about networking tools. The second online training (14 June 2010) was opened up to the full Network and co-hosted by staff from COSEE NOW, COSEE Central Gulf of Mexico and COSEE West; this session covered the use of Elluminate, Moodle, Adobe Connect, and also video-based distance learning technology. Eighteen participants from 10 COSEE Centers (AK, CGOM, CT, FL, GL, NOW, OS, PP, SE, and West) attended this webinar.

